Falling for Rising Temperatures?

Trinks, Arjan

DOI:
10.33612/diss.118608275

Summary

Mitigating climate change requires significant societal change. But global action to keep temperature rise within safe bounds is still highly deficient (UNEP, 2019). Against this backdrop, a heated debate exists about the role that firms and financial markets play in contributing to a solution (Bénabou and Tirole, 2010). However, *why* and *to what extent* would firms and investors care about rising temperatures? Based on a financial-economic framework of risk management, I empirically investigate the relevance of climate-related factors for investment behavior and financial performance. In four chapters, I give attention to the perspectives of investors, firms, and public policy and institutions.

In Chapter 2, I study an increasingly widespread investor practice that aims to address both climate-related financial risk and social preferences in capital allocation decisions, namely fossil fuel divestment. I investigate the risk and return characteristics of fossil fuel industry assets and fossil-free investment portfolios. I show that, over an extensive time period, the divestment of fossil fuel assets has no significant negative impact on risk-adjusted returns and does not impair the possibilities for portfolio diversification. These findings can be explained by the relatively limited diversification benefits that fossil fuel assets provide to investment portfolios as well as by the lack of persistent influences of divestment practices on asset prices.

Chapters 3 and 4 take the perspective of the multinational firm. Chapter 3 employs a portfolio approach to test how high- and low-emitting firms are priced in financial markets and panel estimation techniques to examine the impact of firms' carbon intensity on financial risk and, therefore, the cost of equity capital. In this chapter, little evidence is found for mispricing related to carbon intensities. Instead, robust support is found for a direct positive effect of carbon intensity on systematic risk: high-emitting firms are significantly more sensitive to macroeconomic fluctuations than their lower-emitting peers. This implies that emission reduction can have a valuable risk-mitigating function.

In Chapter 4, I provide a more detailed perspective of firms' relative dependence on carbon emissions in production activities. I propose a measure called 'carbon efficiency', which builds on recent advances in production theory to evaluate firms' carbon emissions in a joint production framework, accounting for aspects of total factor productivity, sector-relative performance, and factor-input inefficiencies. Based on panel estimation techniques,

I document superior operational performance and lower systematic risk in carbon-efficient firms. This effect is partly attributable to the close relationship between carbon efficiency and resource efficiency. However, controlling for these effects, a positive impact of carbon efficiency on financial performance remains, particularly lowering systematic risk. The findings of this chapter, therefore, suggest that carbon-efficient production can be valuable from both operational and risk management perspectives.

Chapter 5 focuses on the role that climate policy and institutional factors play in shaping investment behavior. In this chapter, I employ logistic regression techniques to explore the factors behind an emerging corporate practice that may help bring forward emission-reduction projects, namely internal carbon pricing. I focus on the extent to which this practice is explained by expected stringency of, and uncertainty about, future carbon constraints. My findings show that firms tend to account for future carbon constraints internally when public emission-reduction policies are sufficiently stringent and tangible.

Overall, this thesis highlights that risk management provides firms and investors with an important reason to care about rising temperatures.